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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/567,646	07/10/2006	Atsushi Seki	P29237	2445
7055 7590 12/27/2007 GREENBLUM & BERNSTEIN, P.L.C. 1950 ROLAND CLARKE PLACE RESTON, VA 20191			EXAMINER BOLDA, ERIC L	
			ART UNIT 3663	PAPER NUMBER
			NOTIFICATION DATE 12/27/2007	DELIVERY MODE ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

gbpatent@gbpatent.com  
pto@gbpatent.com

<b>Office Action Summary</b>	Application No. 10/567,646	Applicant(s) SEKI, ATSUSHI	
	Examiner Eric Boldt	Art Unit 3663	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 19 October 2007.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) 10, 11 and 21 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-9 and 12-21 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 October 2007 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>5/24/2007</u> . | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Election/Restrictions***

1. Applicant's election of species A (fig. 1) in the reply filed on Oct. 19, 2007 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)). Claims 1-9 and 12-20 are examined on the merits.

### ***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 4, 5, 15 and 16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The claims do not make grammatical sense; they appear to be literal translations from a foreign language. The claims are interpreted as best understood by the Examiner.

### ***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-9 and 12-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shiota et al. (US 6,535,331) in view of DiGiovanni et al. (5,115,338).

With regard to claims 1 and 12, Shiota discloses in Fig. 2 a wideband optical amplifier comprising

- a first optical fiber amplifier (21) that amplifies incident light,
- a first front end pumping light source (31) that generates pumping light supplied to the first fiber amplifier
- a first WDM coupler (31c) acting as means to introduce pumping light to the first optical fiber amplifier
- a second optical fiber amplifier (22)
- a second pumping light source (32) that generates pumping light supplied to the second optical fiber amplifier
- a second WDM coupler (32c) acting as means to introduce pumping light to the second optical fiber amplifier
- an optical connecting means (optical switch (50)) that connects an outgoing side of the first fiber amplifier (1) and output terminal (2), in the case of C-band operation, *or* connects the outgoing side (1) of the first fiber amplifier (21) and the incident side (4) of the second optical fiber amplifier (22), thereby causing the second optical fiber amplifier to amplify outgoing light of said first optical fiber.

Shiota does not disclose second stage fibers, i. e. that the first fiber amplifier is actually consisting of a front-end and back end fiber amplifier, and that the second fiber amplifier is actually consisting of a front-end and back end fiber amplifier. However, Digiovanni teaches an optical fiber amplifier with two gain stages (18) and (19), which

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can be designate as the front end (receives input signal) and back end (outputs final amplified signal). Replacing the single stage fiber amplifiers (21) and (22) of Shiota each with the two-stage amplifier of DiGiovanni would result in the claimed invention. Note that, since the second stage in DiGiovanni's Fig. 1 is backward pumped, placing the optical switch between the optical amplifier (19) and its backward pump (32) results in a connection of the outgoing side of the first band-end optical amplifier and the back-end pumping light introducing means (multiplexer (28)) in one of the switching positions. It would have been obvious to one skilled in the art (e. g. an optical engineer) to replace the single stage amplifiers of Shiota, with the two-stage amplifiers of DiGiovanni, for the advantage of achieving higher gain with more efficient use of pump light (DiGiovanni, 4<sup>th</sup> para. lines 52-60).

With regard to claims 3 and 14, in Shiota Fig. 2 the optical switch connects the outgoing side of the first optical amplifier to the incident side of the second optical fiber. When the optical amplifiers are replaced by two-stage amplifiers as taught by DiGiovanni, as described above, the claim limitations are met.

With regard to claims 4, 5, 15, and 16, the combined gain signal of the first front end and second front end amplifiers is larger than the noise from the second stage of the first amplifier.

With regard to claims 6, 7, 17, and 18, the clauses "a wavelength band of the outgoing light of said first back-end optical fiber amplifier is the C-band" etc. are essentially statements of intended or desired use, or of material worked upon by the apparatus. Thus, these claims as well as other statements of intended use do not serve

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to patentably distinguish the claimed structure over that of the reference. See MPEP § 2114 and 2115. In this case, when only the first optical amplifier (21) is switched in (from (1) to (2), the wavelength band of the outgoing light is C-band. When the second optical amplifier (22) is switched in (from (1) to (4) and (3) to (2)) the band of the output light is L-band.

With regard to claims 8 and 19, the optical amplifiers are erbium-doped optical fiber.

With regard to claims 9 and 20, the pumping light source generates 980 nm wavelength light (DiGiovanni, 3<sup>rd</sup> col. lines 63-68).

With regard to claims 2 and 13, the two stages of each amplifier as taught by DiGiovanni comprise an isolator (16) that blocks light from the second (back-end) (19) to the first (front-end) stage (18).

#### ***Information Disclosure Statement***

6. The information disclosure statement filed on May 24, 2006 has been considered by the Examiner.

#### **Conclusion**


7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure: Srivistava et al., Rapp, So et al., Grubb et al., Price et al.

8. Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Eric Bolda whose telephone number is 571-272-8104. The examiner can normally be reached on M-F from 8:30am to 5pm.

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If attempts to reach the examiner by telephone are unsuccessful, the Examiner's supervisor, Jack Keith, can be reached on 571-272-6878. Please note the fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Eric Boldt